

What is claimed is:

1. A method of processing a surface of a substrate to be processed, the method comprising:

an etching process to supply the substrate having a resist pattern formed thereon with a chemical liquid thereby to remove an oxidation film on the surface of the substrate therefrom;

a rinsing process to supply the substrate with a rinsing liquid thereby to wash the surface of the substrate;

a hydrophilic process to supply the substrate with an ozone water thereby to form an oxidation film on the surface of the substrate for providing hydrophilicity therefor; and

a drying process to eliminate moisture adhering to the surface of the substrate.

2. A method as claimed in Claim 1, wherein the drying process is accomplished by supplying dry gas to the substrate to be processed.

3. A method as claimed in Claim 1, wherein the drying process is accomplished by rotating the substrate to be processed.

4. A method as claimed in Claim 1, wherein the ozone water in the hydrophilic process has a concentration ranging from 0.5 to 10 PPM.

5. A substrate-surface processing method of sorting out a substrate having a resist pattern formed thereon from another substrate having no resist pattern formed thereon and further applying different processes to the substrates selectively, the method comprising, for the substrate having the resist pattern formed thereon:

an etching process to supply the substrate with a chemical liquid thereby to remove an oxidation film on the surface of the substrate therefrom;

a rinsing process to supply the substrate with a rinsing

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liquid thereby to wash the surface of the substrate;  
 a hydrophilic process to supply the substrate with an ozone water thereby to form an oxidation film on the surface of the substrate for hydrophilicity thereof; and  
 a drying process to eliminate moisture adhering to the surface of the substrate;

the method comprising, for the substrate having no resist pattern formed thereon:

an etching process to supply the substrate having no resist pattern formed thereon with a chemical liquid thereby to remove an oxidation film on the surface of the substrate therefrom;

a rinsing process to supply the substrate with a rinsing liquid thereby to wash the surface of the substrate; and

a drying process to supply the substrate with a dry solvent thereby to eliminate moisture adhering to the surface of the substrate.

6. A substrate-surface processing method as claimed in Claim 5, wherein the drying process for the substrate having the resist pattern formed thereon is accomplished by supplying dry gas to the substrate to be processed.

7. A substrate-surface processing method as claimed in Claim 5, wherein the drying process for the substrate having the resist pattern formed thereon is accomplished by rotating the substrate to be processed.

8. A substrate-surface processing apparatus for processing a surface of a substrate to be processed, the apparatus comprising:

a processing container for accommodating the substrate therein;

a chemical-liquid supply system for supplying the substrate in the processing container with a chemical liquid for removing an oxidation film formed on the substrate;

a rinsing-liquid supply system for supplying the

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substrate in the processing container with a rinsing liquid for washing;

an ozone-water supply system for supplying the substrate in the processing container with an ozone water;

a substrate drying system for drying the substrate in the processing container;

a dry-solvent supply system for supplying the substrate in the processing container with a dry solvent; and

a controller for generating operative signals to drive both of the ozone-water supply system and the substrate drying system when the substrate having a resist pattern formed thereon is accommodated in the processing container, the controller also generating an operative signal to drive the dry-solvent supply system in place of the ozone-water supply system and the substrate drying system when the substrate having no resist pattern formed thereon is accommodated in the processing container.

9. A substrate-surface processing apparatus as claimed in Claim 8, wherein the substrate drying system is a dry-gas supply system for supplying dry gas into the processing container.

10. A substrate-surface processing apparatus as claimed in Claim 9, wherein the rinsing-liquid supply system has a supply pipe which connects a rinsing-liquid source for the rinsing liquid for washing with the processing container;

the chemical-liquid supply system has a chemical-liquid source for reserving the chemical liquid for removing the oxidation film and a chemical-liquid pipe connecting the chemical-liquid source with the supply pipe; and

the ozone-water supply system has an ozone-water source and an ozone-water pipe connecting the ozone-water source with the supply pipe.

11. A substrate-surface processing apparatus as claimed in Claim 8, wherein the substrate drying system is a rotary

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drying system which rotates the substrate.

12. A substrate-surface processing apparatus as claimed in Claim 11, wherein the rinsing-liquid supply system has a supply pipe which connects a rinsing-liquid source for the rinsing liquid for washing with the processing container; the chemical-liquid supply system has a chemical-liquid source for reserving the chemical liquid for removing the oxidation film and a chemical-liquid pipe connecting the chemical-liquid source with the supply pipe; and the ozone-water supply system has an ozone-water source and an ozone-water pipe connecting the ozone-water source with the supply pipe.

13. A substrate-surface processing apparatus as claimed in Claim 9, wherein the processing container contains a liquid-process container for carrying out a liquid processing inside thereof and a dry-process container for carrying out a drying process inside thereof.

14. A substrate-surface processing apparatus as claimed in Claim 13, wherein the dry-process container is arranged above the liquid-process container; and

the liquid-process container has a liquid-process chamber connected with a dry-process chamber in the dry-process container through a communication port arranged between the liquid-process container and the dry-process container.

15. A substrate-surface processing apparatus as claimed in Claim 11, wherein the processing container contains a liquid-process container for carrying out a liquid process inside thereof and a dry-process container for carrying out a drying process inside thereof.

16. A substrate-surface processing apparatus as claimed in Claim 15, wherein the liquid-process container is arranged

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so as to be insertable into and withdrawable from the dry-process container;

at the liquid process, the liquid-process container performs the liquid process while accommodating the substrate therein; and

at the drying processing, the liquid-process container withdraws from a position to accommodate the substrate therein and the dry-process container performs the drying process while accommodating the substrate therein.

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